

5.11 PhD in Systems Engineering

5.11.1 Program Description

The Department of Systems and Engineering Management offers a doctoral program which leads to the award of a Ph.D. The Doctor of Philosophy degree is a research degree that recognizes mastery in the field of Systems Engineering, a demonstrated ability to conduct independent research and the dissemination of significant and original contributions to the Systems Engineering body of knowledge.

5.11.2 School and Program Admission Criteria

The general requirements for admission to the PhD program are as follows.

DEGREE REQUIRED: An engineering Masters degree (Aeronautical, Astronautical, Aerospace, Chemical, Civil, Computer, Industrial, Mechanical, Electrical, or Systems Engineering). Other relevant Masters degrees, together with an engineering BS, may be considered on a case-by-case basis.

TEST REQUIRED: – GRE – 550V/650Q

GPA REQUIRED: OVERALL - 3.5

Waivers to the above criteria may be granted on a case by case basis. Therefore, individuals whose academic credentials fall below any of the above criteria may apply.

5.11.3 Degree Requirements

The PhD degree program consists of two phases:

Coursework

Phase 1 includes course work and examination period of 4- 6 academic quarters. All requirements for admission to candidacy (course work, examination, committee selection and approval of research prospectus) are met.

A minimum of 36 hours (post-MS) consisting of 28 hours of integrated coursework which supports the student's area of research specialization and 8 hours of mathematics. This coursework will normally be at the 600-level or above.

Dissertation

Phase 2 is dedicated to research. This lasts 12-24 months and the PhD candidate devotes their full attention to a research problem described in their prospectus, under the direction of an approved advisor and committee. At least 48 hours must be taken (at least one year residency requirement) of Dissertation Research, leading to the successful defense of the Ph.D. dissertation.

5.12 Graduate Operational Technology (OpTech) Certificate

5.12.1 Program Description

The Graduate School of Engineering and Management, Department of Systems and Engineering Management, offers the Operational Technology (OpTech) certificate. The program provides students with an in-depth study of the unique challenges associated with developing new defense products and systems within the DoD and Air Force. The program is intended to provide exposure to the warfighter's perspective regarding combat operations and to broaden/deepen technical background relevant to those operations. Students will learn the principles of project management, systems engineering and technological innovation necessary for effective defense product development.

OpTech studies are accomplished by a multi-disciplinary team of students (mechanical, electrical, aerospace, physics, chemical, etc.). Graduates should be well positioned to use their technical skills to analyze complex problems, design feasible solutions, and lead technical teams.

5.12.2 Program Educational Objectives (PEOs)

Graduates of the Operational Technology certificate program should be able to:

1. Understand and apply the concepts, methods, and tools related to research and development of new defense products including planning, directing, and controlling resources (people, material, equipment, and funds) in a systems management context.
2. Understand and apply concepts from a wide range of business disciplines within the specific context of DoD product development.
3. Understand the overall DoD and USAF product development and systems development environment.
4. Provide oversight support and make specific recommendations on appropriate strategies and administration techniques for each phase of a weapon system development effort.
5. Apply the best commercial practices to the DoD product development process.

5.12.3 School and Program Admission Criteria

The general requirements for admission to the Operational Technology Certificate are as follows.

DEGREE REQUIRED: An undergraduate degree in a technical area (engineering, math or science) or with significant technical content.

MATHEMATICS REQUIRED: Differential and Integral Calculus

TEST REQUIRED: None

GPA REQUIRED: OVERALL - 3.0; MATH – 3.0

The target audience for the OpTech program is young scientific and engineering (S&E) officers and civilians, as well as technically trained project managers who will become future leaders in the S&E fields. The OpTech certificate program is designed for part-time students.

For more information about this program and to apply, go to AFIT/ AFRL Center for Rapid Product Development website (<http://www.afit.edu/crpd/Academics.cfm>).

5.12.4 Course Sequence/ Sample EdPlan

Five courses are conducted over a 9-month period in which students are presented graduate-level material and are provided laboratory time to apply the academic principles they are learning. Because of the time commitment, strong support is required from students' supervisors and leadership throughout the program.

The courses required to earn the Graduate Certificate are as follows (shown in the quarter they are offered).

RDMT 541	(Fall)	Operational Technology and Innovation
SENG 520	(Fall)	Systems Engineering Design
SMGT 543	(Winter)	Systems Acquisition Management
RDMT 642	(Winter)	Sys Dev I – Concept Development
RDMT 643	(Spring)	Sys Dev II – Sys Design & Implementation